a second conductive material non-leachably disposed on a second surface of the planar substrate to form a counter electrode, a reference electrode, or a counter-reference electrode;

an enzyme non-leachably disposed proximate to the working electrode; and

an analyte mass transport limiting layer disposed over at least a portion of the working electrode to limit transport of an analyte to the working electrode;

wherein the sensor is configured and arranged for transcutaneous implantation into the body of an animal for contact with body fluid of the animal.

128. The electrochemical sensor of claim 127, wherein the first conductive material comprises carbon.

129. The electrochemical sensor of claim 127, wherein the first conductive material consists essentially of carbon.

130. The electrochemical sensor of claim 127, wherein the second conductive material comprises Ag/AgCl.

131. The electrochemical sensor of claim 127, wherein the first conductive material and the second conductive material are the same.

132. The electrochemical sensor of claim 127 comprising one working electrode.

133. The electrochemical sensor of claim 127 comprising two or more working electrodes.

134. The electrochemical sensor of claim 127, wherein the substrate has a thickness in the range of 50-500μm.

135. The electrochemical sensor of claim 134, wherein the substrate has a thickness in the range of 100-300μm.

136. The electrochemical sensor of claim 127, wherein the surface of the substrate comprises a wide portion and a narrow portion, the narrow portion being configured for subcutaneous implantation into the animal.

137. The electrochemical sensor of claim 136, wherein the narrow portion has a length in the range of 2 cm or less.

138. The electrochemical sensor of claim 136, wherein the narrow portion has a width in the range of 2 mm or less.

139. The electrochemical sensor of claim 138, wherein the narrow portion has a width in the range of 1 mm or less.

140. The electrochemical sensor of claim 139, wherein the narrow portion has a width in the range of 0.5 mm or less.

141. The electrochemical sensor of claim 127, further comprising an electron transfer agent nonleachably disposed proximate the working electrode to transfer electrons between the working electrode and the analyte.

142. The electrochemical sensor of claim 141, wherein the electron transfer agent is immobilized on the working electrode.

143. The electrochemical sensor of claim 141, wherein the electron transfer agent comprises a redox polymer.

144. The electrochemical sensor of claim 141, wherein at least 90% of the electron transfer agent remains disposed on the working electrode after immersion in interstitial fluid at 37°C for 24 hours.

145. The electrochemical sensor of claim 144, wherein at least 99% of the electron transfer agent remains disposed on the working electrode after immersion in interstitial fluid at 37°C for 24 hours.

146. The electrochemical sensor of claim 141, wherein at least 90% of the electron transfer agent remains disposed on the working electrode after immersion in interstitial fluid at 37°C for 72 hours.

147. The electrochemical sensor of claim 141, wherein the electron transfer agent is immobilized in a sol-gel material.

148. The electrochemical sensor of claim 127, further comprising:

a recessed channel formed in a surface of the substrate; and

a conductive material disposed in the recessed channel and forming the working electrode.

149. The electrochemical sensor of claim 148, wherein the recessed channel has a width of 250 μm or less.

150. The electrochemical sensor of claim 148, further comprising a second recessed channel and a second conductive material disposed in the recessed channel, the second conductive material forming a counter electrode.

151. The electrochemical sensor of claim 150, further comprising a third recessed channel and a third conductive material disposed in the channel, the third conductive material forming a reference electrode.

152. The electrochemical sensor of claim 127, further comprising a biocompatible coating disposed over at least a portion of the working electrode.

24 ~~153.~~ The electrochemical sensor of claim 127, further comprising a temperature probe disposed on the substrate, the temperature probe having a plurality of spaced-apart probe leads and a temperature-dependent element in contact with the spaced-apart probe leads, the temperature-dependent element comprising a material having a temperature-dependent characteristic that produces a change in a signal of the temperature probe in response to a change in temperature.

~~154~~ 25. The electrochemical sensor of claim 153, wherein the temperature-dependent characteristic comprises a resistance of the probe element.

Cont 26 ~~155~~. The electrochemical sensor of claim 153, wherein the material of the temperature-dependent element comprises carbon.

27 156. The electrochemical sensor of claim 153, wherein the temperature-dependent element comprises a conductive material with a smaller cross-section than the probe leads.

28 157. The electrochemical sensor of claim 153, wherein the temperature-dependent element is disposed in a recessed channel on a surface of the substrate.

29 158. The electrochemical sensor of claim 153, wherein the probe leads are disposed in recessed channels on a surface of the substrate.

30 159. The electrochemical sensor of claim 127, wherein a portion of the electrochemical sensor is configured for implantation into an animal and an anticlotting agent is disposed on a portion of the substrate that is configured for implantation.

~~160~~ 31. The electrochemical sensor of claim 127, wherein the mass transport limiting layer is made of a film that absorbs less than 5 wt. % of fluid over a 24 hour period in the temperature range of 25° C to 45° C.

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161. The electrochemical sensor of claim 127, wherein the permeability of the mass transport limiting layer to the analyte changes no more that 4% per C in the temperature range of 30° C to 40° C.

162. The electrochemical sensor of claim 127, wherein the mass transport limiting layer includes pores of 3 to 20,000 nm in diameter.

163. The electrochemical sensor of claim 127, comprising one or more contact pads disposed on the first surface of the substrate and in electrical contact with the one or more working electrodes.

164. The electrochemical sensor of claim 163, further comprising a contact pad disposed on the second surface of the substrate and in electrical contact with the counter electrode, reference electrode or counter-reference electrode.

165. The electrochemical sensor of claim 163, wherein at least one of the one or more contact pads comprises a conductive polymer.

166. The electrochemical sensor of claim 163, wherein at least one of the one or more contact pads consists essentially of carbon.

167. A method of determining a level of an analyte in a fluid, the method comprising:

contacting the fluid with the electrochemical sensor of claim 127;

generating an electrical signal in the sensor in response to the presence of the analyte; and

determining a level of the analyte from the electrical signal.

168. The method of claim 167, wherein contacting the fluid with an electrochemical sensor comprises implanting a portion of the electrochemical sensor in an animal so that the electrochemical sensor is in contact with a body fluid of the animal.